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Symmes' offers to lead them through the polar openings. It was thought that, with the first annunciation of the proposal, the Neptunians and Vulcanians would have respectively fitted out their expeditions :—that the one party, in a fire proof ship, with ropes and sails of amianthus, and masts of iron, with fire engines and fire buckets, and every thing necessary to withstand a conflagration, would have sailed off, in a mass, to the southern opening, to explore their internal volcanoes. We do not say that they would have been bound in duty all to jump in ; but till they had gone to the crater, till they had brought us back some of their internal obsidian, till they had shown us a fragment of basalt or celestine from Symzonia, they could not have asked of the public any farther faith in their theories. Meantime, we should have looked for a corresponding conduct on the part of the Wernerians ; an outfit to the interior gulf, a tight seaworthy vessel, with ample provisions to go and plough about on the edges of the great abyss,—and then if they had come back and told us they had actually seen their old red sand stone, in a state of paste, and their antediluvian fish working their way through a surf of liquid schistus, they would have done more for their theory than they have hitherto been able to effect. This they should have done, but instead of this they keep grovelling upon the Calton hill, the chalk basin of Paris, and the Harz mountains, and if a piece of lava or madreporite from the centre would save the nation, we do not believe there is one of them would go and fetch it.

But it is time to draw to a close, and we beg leave to recommend the discoveries of Col. Symmes again to the public. His success with the unexplored interior of our earth is so signal, that we advise him next to turn his attention to the moon, unless as some features in his speculations lead us to think, he has already done it.

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**ART. VII.—1.** *Report of the civil and military engineer of the State of South Carolina, for the year 1819.*

2. *Plans and progress of internal improvement in South Carolina, with observations on the advantages resulting therefrom, to the Agricultural and Commercial interests of the State.* Columbia, 1820.

3. *Report of the Board of Public Works to the legislature of South Carolina for the year 1820.*

IN the complaints, which are so often and perhaps so justly made, of the want of *national* patronage for great public objects, too little, it may be, has been thought of the tendency of all our political institutions, to throw the care of these objects upon those who are more immediately concerned in effecting them. In a country of such prodigious extent as ours, presenting such occasion for every species of public works and public improvements, it will be allowed that the national legislature ought to proceed with extreme caution, in applying the common funds of the state to objects which may not be of common utility. But we are divided into independent communities so rich and powerful, that scarce any object of public utility is beyond the grasp of the resources of the single states ; so that, after all, the care of individual objects of public improvement is put into the hands of those most sure to be benefited by them, and most concerned by interest and most enabled by local situation to accomplish them with zeal and economy. At the same time that this consideration ought to reconcile us to the abandonment to state patronage of many objects, to which the great engine of the national resources might be honourably and usefully applied, we are far from defending a penurious policy on the part of the general government ; and of all the applications of the principle of constructive powers, if we may be pardoned the pleasantry in a serious connexion, we regard with most complacency that which authorizes Congress to construct roads, canals, and other similar public works. That the cause of internal improvement meantime is not suffering in the hands of the states, is abundantly evinced, not only in the truly glorious enterprise now achieving in New York, to which we have long coveted and hope soon to enjoy an opportunity of particularly calling our readers' attention, but in the public works of the states of Virginia and North Carolina, to which we have, in former numbers of our journal, devoted some of our pages, and those which are going on in the same spirit in South Carolina.

It is obvious that commerce depends not only on the diversity in the productions of different countries ; but on the comparative cost in different countries of the same article. Among the circumstances that affect this, the expense of transportation from the place of growth or manufacture to the market is not the least considerable. In the case of an article so

bulky as cotton, this must necessarily constitute a material part of the cost. For this reason, canals, which have ever been an important object in commercial and manufacturing nations, and in the eyes of enlightened governments, become peculiarly so in a region, of which the staple is of the character alluded to.

South Carolina, generally speaking, possesses a fertile soil, and from an early period contributed largely to British commerce, in the articles of indigo and rice. Of late years not only has the first of these given place, in the lower districts, to that variety of the cotton plant distinguished by its short staple and green seed; but it has been found that the higher lands are congenial to the same species of cotton. It has accordingly spread through the western districts; a circumstance which greatly adds to the importance of the works, which have for their object the facilitating of the water carriage from the upper portions of the state to the coast.

The state contains about twenty-four thousand square miles, and is naturally divided into the primitive and the alluvial country, the former extending westward from the falls of the rivers, the latter eastward about an hundred miles to the sea. As the climate of the upper country permits white men to labor, it has become populous; and if the predominance of political influence is found in this section of the state, it is warmly seconded by the lower country in the measures especially necessary to its prosperity.

During the war in Europe and the increased demand for cotton, its culture rapidly extended; but when peace allowed commercial nations to resume their enterprise, a supply of this commodity would of course be sought from sources least obstructed and expensive; and in the market of American cotton thus reduced those portions of our country would necessarily have the advantage, who could bring their produce cheapest to the coast. Discerning men in South Carolina could not be slow in perceiving, that neighbouring states were in possession of advantages of natural navigation from the interior superior to their own. It was plain that the Mississippi would pour a large amount of that staple product into the marts of the old world, at little expense beyond its first cost. The Savannah had been rendered navigable for steam boats, and the rate of carriage from Augusta to the metropolis materially reduced; while the fertility of the banks of the

Alabama was inviting the emigration of their enterprising fellow-citizens. Meantime, however, it was equally open to remark, that South Carolina itself was traversed by numerous rivers, and possessed the advantage of an excellent port ; and of a wealthy metropolis, towards which every stream directed its course, actually requiring less expense to be rendered navigable, than the cost of land carriage for a single year. The importance of these considerations may be estimated by the value of the annual exports of the state, which had now risen to fourteen millions.

Accordingly in December 1818, on the motion of Mr Poinsett, the legislature passed a resolve, directing ‘ the civil and military engineer of the state to devise and adopt all such means as he shall deem expedient for opening certain rivers, therein specified.’ We beg leave to invite the attention of our readers to the objects contemplated in this resolve, and the progress made in effecting them.

The principal rivers of the state of South Carolina are the Santee and the Pedee, and each has been the object of important enterprises for the improvement of the navigation. The Santee communicates with Charleston by the Sea Island passages, and is ascended without material obstruction to the vicinity of Columbia, a distance of one hundred and fifty miles. This city, the seat of government, is situated on an elevated plain, near the junction of the branches of the Congaree, denominated the Saluda and the Broad river. These latter streams, after flowing more than a hundred miles through a productive country, as they approach each other, are precipitated over successive ledges of granite, of no inconsiderable elevation and extent, and one great object in the internal improvements in South Carolina has been to remove the obstacles thus produced in this part of the water carriage. The judicious plan of the engineer appears to have been, to throw a dam across the Saluda, at the head of the falls, and from the more elevated surface of the river thus produced, to fill a canal, opened for the distance of two miles across the intervening ground, to Broad river ; into which a descent is effected by locks about the middle of the falls. He then placed a dam a short space below the lock, and thereby flowed the upper part of the falls, and produced a reservoir to supply another canal, formed within the opposite shore, between the river and the city, leading at the distance of three miles, to

deep water at the steam-boat landing. In its course opposite the town, this canal is enlarged into a dock, for the reception of the luggage boats from below to exchange loads with the smaller craft of the upper navigation.

After the confluence of the Saluda and Broad river, the stream takes the name of Congaree to its junction with the Wateree; after which, under the name of the Santee it descends to the ocean. The Wateree is naturally navigable to Camden. Above that town several falls occur, at which considerable works will be necessary, before we come to Rocky Mount, the greatest of the falls of South Carolina, and beyond which the river still bears its native name of Catawba. This fall extends eight miles, and measures a hundred and seventy-eight feet of perpendicular descent. The canal already commenced at this place, though remarkably favored by local circumstances, must be expensive. It does not appear that any estimate thereof is offered. When we recollect the inherent difficulty of computing an expense which depends on so many contingencies, the omission is not injudicious. It is said, however, in the report, that 'its completion (together with the works doing in North Carolina) will open the navigation to the foot of the Blue Ridge, within fifty miles of the navigable waters of Tennessee and three hundred from Charleston, in a direct route for the trade of the Western States.' This route may be very important, especially in time of war, in connexion with the water communication between the Southern and Eastern States, subsequently to be mentioned.

The Pedee, which name the Yadkin takes after an extensive course through the most productive districts of North Carolina, waters all the northern part of the state of South Carolina in a course of two hundred and fifty miles, till it finally reaches the coast at Georgetown harbor. By the skilful application of mechanical engines, the bed of this river has been cleared, in two seasons, of the accumulations, which collect in streams in an alluvial country before the banks are made a subject of public care. The several branches, moreover, of this river appear to be all considered of importance in the general plan. The Waccamaw has, however, been esteemed of peculiar importance. Its course is nearly parallel to the sea coast, and it is of a depth capable of carrying vessels of one hundred and fifty tons to the dis-

tance of eighty miles. This river owes its peculiar importance to the circumstance, that the inland water communication, so desirable between the southern and middle states, must be opened by means of a short canal from the nearest point of its course to Little river. This river discharges itself near Beaufort, within the Sea Islands of North Carolina. By means of these works and the other improvements and natural means of the adjoining states, a water carriage becomes practicable from Florida to the head of Chesapeake Bay, thence to the Delaware, by the canal long since commenced, (but suspended for want of funds,) and from the Delaware to the Raritan; conveying southern produce to the remotest shores of the lakes and to the centre of New England. In a time of war especially, this inland navigation would be of great importance, defended as it might readily be, at exposed points, by floating batteries or steam gun-boats. Experience has already taught this country how severely the interruption of commercial intercourse would be felt, under long continued hostilities, without safe water carriage both of produce and other merchandise, to say nothing of the munitions of war, and supplies for the navy.

The general plan of the improvements in South Carolina, is to concentrate all the business of the state, and of some part of the adjoining states, at the capital. From the harbor of Georgetown, therefore, a canal is making five miles, across the tongue of land which separates it from the Santee. If we consider the quantity of produce that must descend all these rivers to pass this little work, its beneficial effect must be very great, compared with its expense; besides its importance, when viewed as a part of the chain of inland water communication among the states. We have only to apprehend, that it may be made on too narrow a scale for that great purpose, and without conformity perhaps to the other links in the chain. It must not be forgotten, that the dimensions of this work will regulate those, which may hereafter be made in relation to it, in the other states, where manufactures are as progressive, as the agriculture of South Carolina.

But we ought to retract our hesitating expression when we regard the liberality and enlightened spirit which the state has already evinced. One million of dollars was at once appropriated to these various works; and not less than a thousand northern laborers employed the second season. The works were commenced at once in so many places, that it was im-

possible for the state's engineer to conduct them. To remedy this defect, at the session of 1819 the Board of Public Works was constituted by an act of the legislature, composed of five members, two of whom are professional engineers, with salaries, the others public spirited individuals, who serve without compensation. The board is invested with corporate powers, and all requisite authority, and is under the presidency of Mr Poinsett.

Besides the works already enumerated, the Ashley, which flows on the southern side of Charleston, is to be connected with the Edisto, by a canal of twelve miles. This river divides itself into two branches, and waters an extensive district towards the Savannah, the southern boundary of the state. And it seems to be even intended to open a communication with that extensive river. The board have, moreover, comprehended in their design every conceivable improvement for the facilitating of the inland communication. They have made no small progress in the formation of a road, leading through the state towards Tennessee. It extends already, according to the report, from Charleston to Columbia, and from that town to the Saluda mountain. In all their operations the views of the board appear to have been ably seconded by the personal exertions of gentlemen of fortune and influence in every part of the country.

It has not escaped the observation of the intelligent projectors of these works, that they would avail but little, without a good system of navigation. It has, therefore, been their policy to encourage the introduction of steam boats, and other modes of conveyance, from which it has been demonstrated from some examples how great the savings to the public must finally be. We find it stated, in the second pamphlet at the head of our article, that 'since the Pedee river has been cleared of obstructions, so as to afford navigation for steam and team boats, cotton has been carried from Chatham and Society Hill to Georgetown for seventy-five cents the bale, whereas it could not be carried the same distance, by land, for less than two dollars, or by water, by the former navigation, for less than one dollar twenty-five cents.'

From Columbia, it is supposed, though this is not stated in the report, that 200,000 bales annually, of cotton, may be expected to descend. The saving of the cost of carriage on this amount would be - \$250,000



The difference between land and water carriage on half the quantity down to Columbia may be estimated at - - - - - 125,000

The saving on merchandise carried into the country we have no means of knowing but by comparison. The country which Charleston must supply is more extensive than New England. Now, through Hadley canal, on Connecticut river, there pass annually 6000 tons, through Middlesex canal about 2000, and on the intermediate roads probably 3000; in all 11,000 tons, with a saving of 10 dollars a ton, on water transportation. Allowing no more to South Carolina, we must to the former items add, for the saving of 10 dollars on 11,000 tons - - - - - 110,000

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\$485,000

Such is the annual saving in one district only of the state. The benefit, however, will principally depend on the modes of conveyance that shall be adopted. That mode of course will be preferable which shall best subserve the interest of the planter and the merchant; not that which is numerically the cheapest, but that which shall unite despatch with safety, regularity and economy of time, as well as moderateness of expense. The time required for the transport of produce to market is of material consequence. The demand, early in the season, is brisk; and the sooner the crop is down, the more opportunities there will be of a sale; besides, that the cotton is gathered in and prepared successively. Every great planter has successive quantities to send to market, and is solicitous to get them quickly to the hands of his factor. The reasons for despatch are scarcely less urgent in the transport of supplies into the country, especially towards the close of the spring business and the approach of midsummer, when intercourse with the seaports is suspended for some months.

We are led to these remarks from seeing that some reliance is placed, by the board, on the use of animal power in navigating these extensive rivers. It is not our purpose to decry experiments of any kind; nor to discredit the utility of this mode of conveyance, when nothing better is to be done. When, however, this last is not the case, it is an obvious question, whether the substitution of the power of the steam engine for horses has been fallacious. In England, the breweries, dis-

tilleries, and mines, are notorious instances of the preference of steam engines ; and the use of them on rail roads would be more applicable still to the elucidation of the point, were we better furnished with facts.

It is stated in the report, that a boat propelled by the labor of eight mules, navigated by five men, carried three hundred bales two hundred and fifty miles in fifteen days, at the expense of a hundred and sixteen dollars twenty-five cents, and that the freight was seventy-five cents a bale, amounting to two hundred twenty-five dollars ; of course the apparent profit to the navigators was a hundred and eight dollars seventy-five cents. The object of this statement was only to shew the savings by this operation to the public, as the land carriage of the same number of bales would have amounted to six hundred dollars. It is unquestionably true, that for short distances, animal force may be applicable, while for great distances it is of doubtful expediency, among other reasons, because it cannot in its nature be at every moment equal. It is never operative to the full measure of the force employed. The steam engine on the other hand is a force, at every moment equal and indefatigable ; and, whether great or small, is managed by one man. Though eight mules or horses can be governed and driven at once, it does not follow that sixteen could be. This power, therefore, has its limits in practice. It would be absurd to think of employing in one boat the animal force of forty horses, while it is very easy to use a steam engine of that power.

To estimate the comparative economy of steam engines, and horse power we are enabled to state the facts of an experiment on the Merrimack, in Massachusetts, with a small steam towing boat of five horse power. Her wheel was placed in the stern to enable her to pass through the locks on that navigation. She towed two boats of her own burden along side, and ascended the river at the rate of thirty miles a day. Her expenses are estimated to have been twelve dollars a day, for fuel, men, &c. We are inclined to think that even this steam engine, in the situation of the team boat abovementioned, would have done the business to more advantage, for the reason that the passage would have been made in five days, and at the expense of     -     -     -     -     -     -     \$60  
and would have carried 180 bales at 75 cents     -     -     135  
yielding a profit of     -     -     -     -     -     -     75

or for three trips of five days \$225, which is more than double the profit of the team boat for the same time.

The difference in favor of steam engines appears much greater when on a larger scale. Take, for example, one of fifty tons instead of ten tons, this being the size which we understand is contemplated by the Boston company to navigate the Pedee and pass the five mile canal near Georgetown.

First, the steam boat will receive half

a load	-	-	-	-	-	-	20 tons
2 luggage boats each	40	-	-	-	-	-	80
So that the load is	-	-	-	-	-	-	100 tons or 600 bales.
The equipage and other expenses will be	twenty dollars a						
day, amounting in a passage of seven days to	-	-	-	-	-	-	\$140
Freight at \$1,50 per bale	-	-	-	-	-	-	900

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Apparent profit	-	-	-	-	-	-	760
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Boats exceeding a hundred tons would probably not be so economical, simply because their burden would not perhaps permit of continual freights, nor admit of that celerity and despatch necessary to this branch of navigation.

We scarcely think it necessary to name the superior duration of engines over animals, nor the liability of the latter to sickness and death. It is obvious, that if an engine requires to be readjusted, there is meanwhile no expense for fuel, but if one or two of a set of mules are unable to perform, still the rest must be fed. Experience and interest will undoubtedly instruct and guide men in all kinds of business: nor should we have dwelt thus long on this topic but from the apparent retrocession of this expedient from the great modern improvement of steam navigation.

A difficulty exists in the navigation of the southern rivers, in the liability to extreme drought: but this it is proposed to overcome, in the building of the hulls of steam boats, by the use of that very light and durable timber, the spruce, which abounds in New Hampshire and Maine.

A concurrence of favorable circumstances has attended the rapid settlement and improvement of the fortunate country, of which we have been speaking. In climate and in productions—and ultimately in the facilities of trade, it will be unsurpassed by any other. But an apprehension is sometimes expressed, that the quantity of cotton cultivated between 36° of N. latitude and the gulf of Mexico—and from the

Atlantic to the Mississippi, may be too great for the European demand ; and that we shall meet with a disadvantageous competition from India, and from the South American colonies. Yet this fear seems unfounded for the following reasons, which at once occur. Cotton will bear to be sent to China, when it costs here but ten cents per pound. With good management, it is supposed the planter might afford it even at eight cents. The voyage from the United States to China being much longer than from Bengal thither, we may safely presume, that if we are able to come into competition with India in the cotton market, at this rate of cost here, the price in India must be at least as great, and therefore that the India cotton cannot interfere with ours in Europe, when the price is thus low, because the freight for a longer voyage than we have to perform must also be paid.

The importance of this branch of commerce to the United States is seen in the fact, that more than half of all the cotton manufactured in England is from the United States ; the quantity from India however is not small. In 1810, there were received seventy-nine thousand bales from that country : and from this, two hundred and forty thousand. In 1811, from India, fourteen thousand six hundred bales ; from this country, one hundred and twenty-eight thousand five hundred. The causes, whatever they were, which produced this diminution in one year, evidently affected the India trade, more than the American trade, in this article.

If we have indeed any thing to fear, it is from the Brazils. From that country the importation into England is less than from ours, in the proportion as three to eight, and from all other places, as three to ten. Uncertainty always attends commerce, but the wants of mankind are ever reviving. Our own country will consume a great quantity of cotton, new uses of it will be devised, and the demands of an increasing population, probably equal the progressive extent of its cultivation. When, however, the gross quantity becomes too great, improvements in the quality will be attempted. The use of gypsum as a manure has the same effect on this, as on other plants. Skill in this branch of husbandry will be exerted. The labor of the white population will be found, as it already is in the western districts of the Carolinas, not only practicable, but productive of cotton of better quality.

In contemplating the immense resources of our country, we  
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are perhaps too prone to exult in its advantages. We shall not, however, fear to cherish a sentiment of national pride in them. And although it be not a new thing that a territory, extending through various climes, should reciprocate from its extremities the benefits of trade, yet it is a circumstance equally remarkable and satisfactory, that these United States should be so bound together by diversity of habits and interests; a diversity once supposed to be an ultimate cause of disunion, but which operates essentially as a cement of the national structure.

In closing the report it is stated, 'that from the progress made there is reason to believe that nearly all the improvements contemplated by the legislature, opening an inland navigation of more than fifteen hundred miles, will be completed in the year 1822, and within the sum pledged and set apart for internal improvements.'

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ART. VIII.—*An Anniversary Discourse delivered before the New York Historical Society, December, 1820, by Henry Wheaton.*

OUR former volumes have borne testimony to the value of the anniversary discourses before the New York Historical Society, and the public judgment has anticipated ours in placing this of Mr Wheaton in the most honorable rank of its predecessors. We cannot allow it, however, to take its station among the most respectable of the occasional productions which our literature has furnished, without recording our tribute to the learning and sound philosophy which it displays, and dwelling a moment on one or two of the important topics which it treats.

Mr Wheaton, in choosing a theme for his discourse, was led to wander a little from the usual path, and to select a topic not immediately connected with the history and antiquities of America. The science of public or international law is the subject to which his discourse is devoted, and the design of presenting a concise history of this great science is happily executed within its limits.

Mr Wheaton correctly observes, in the outset, that the ancient nations had very imperfect notions of international justice, and that foreigner, barbarian, and enemy were synony-